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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

JOLLEY, KIRSTEN

ART UNIT

PAPER NUMBER

1762

DATE MAILED: 02/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/308,770

Applicant(s)

SCHWERTFEGER, FRITZ

Examiner

Kirsten C. Jolley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/11/06
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Upon performing an updated search and review of the instant application, the references of WO 96/22942 and Schwertfeger et al., already of record, were reconsidered. It is noted that WO '942/Schwertfeger et al. teach the limitation of "prior to step c), the lyogel is washed with a solution of an orthosilicate capable of bringing about condensation..." which was previously deemed allowable. New rejections are made based on WO 96/22942 in view of Lentz et al., and over the rejections previously of record taken in view of WO '942, as set forth below. Accordingly, the finality of the prior Office action is withdrawn.

Claim Objections

2. Claim 21 is objected to because of the following informalities: In claim 21, line 2, it appears that "ins" should be --in--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 20 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 20 recites the limitation "the aqueous water glass solution" in line 2. There is insufficient antecedent basis for this limitation in the claim.

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Claim 23 recites the limitation "the orthosilicate" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6 and 8-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 96/22942 A1 in view of Lentz (US 3,122,520).

Schwertfeger et al. (US 5,888,425) is used as a working English translation of WO 96/22942 A1.

WO '942 discloses a process for the preparation of organically modified aerogels comprising the steps of claim 1 (see Abstract), including the step of washing the lyogel with a solution of an orthosilicate capable of bringing about condensation as claimed in claim 19 (col. 5, lines 5-13). WO '942 teaches that a surface-silylating substance of formula I is used (col. 2, lines 21-64 of Frank et al.). WO '942 lacks the teaching of using a disiloxane of the claimed formula.

Lentz et al. is cited for its teaching of organosilicon compounds that may be used as surface-silylating/modifying substances for a hydrogel compound that is subsequently washed free of water and dried. It would have been obvious for one having ordinary skill in the art, seeing the references of WO '942 and Lentz et al. in combination, to have substituted any of the

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surface-silylating substances of Lentz et al., including hexaethyldisiloxane or hexamethyldisiloxane which meet the claimed formula, as the surface-silylating substance in the invention of WO '942 with the expectation of successful results since WO '942 and Lentz et al. teach their organosilicon compounds are for the same purpose and are similarly for use in forming aerogels and the compounds react according to the same reaction.

As to claims 6, 8, 18, WO '942 additionally teaches steps of aging aerogels (col. 3, lines 26-31), IR turbidity-promoting agents (col. 5, lines 1-4), and subcritical drying (col. 4, line 54).

As to claim 9, WO '942 teaches washing until the water content is less than 1 wt% (col. 3, lines 31-34 of Frank et al.). As to claims 10 and 21, WO '942 teaches aliphatic or aromatic solvents in col. 3, lines 34-36, including the solvents of claim 21.

As to claims 14-16, WO '942 teaches that surface-silylating is carried out in a solvent, in the presence of an acidic catalyst, and in the presence of trimethylchlorosilane in col. 4, lines 14-27.

As to claim 17, WO '942 teaches washing with a protic or aprotic solvent (col. 4, lines 44-48). As to claim 20, WO '942 teaches preparing the lyogel by the claimed process (col. 3, lines 1-30). As to claim 24, WO '942 teaches washing the lyogel with an aqueous silica solution prior to step d) (col. 5, lines 5-13).

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 96/22942 in view of Lentz et al. as applied to claims 6 and 8-24 above, and further in view of WO 96/06809.

Frank et al. (US 5,866,027) is used as a working English translation of WO 96/06809.

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WO '942 lacks a teaching of adding fibers to the lyogel. WO '809 is applied for its teaching of adding fibers to the gel during formation in order to produce mechanically stable xerogels. It would have been obvious to one having ordinary skill in the art to have added fibers to the sol in the process of WO '942 in order to increase the mechanical stability of the produced xerogel.

8. Claims 6-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 96/06809 A1 in view of Lentz (US 3,122,520) and WO 96/22942 A1.

Frank et al. (US 5,866,027) is used as a working English translation of WO 96/06809 A1, and Schwertfeger et al. (US 5,888,425) is used as a working English translation of WO 96/22942 A1.

WO '809 discloses a process for the preparation of organically modified aerogels comprising the steps of claim 1 (col. 4, lines 28-50 of Frank et al.). WO '809 teaches that a surface-silylating substance is used whereby surface-modifying substances of the general formula R'_nMX_m are used to replace original surface groups with inert groups of the type MR'_n (col. 3, lines 21-64 of Frank et al.). It is noted that where X is a radical -OR'', the surface-modifying substance of WO '809 is a siloxane. WO '809 lacks the teaching of using a *disiloxane* of the claimed formula. Since the list of surface-modifying substances of WO '809 is exemplary, one skilled in the art would have been motivated to look to the prior art for other surface-modifying substances that may be used in its invention.

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Lentz et al. is cited for its teaching of organosilicon compounds that may be used as surface-silylating/modifying substances for a hydrogel compound that is subsequently washed free of water and dried. Lentz et al. teaches that the organosilicon compounds of its invention react with the original surface groups of a hydrogel according to the same reaction: $R_nSiX + HOSi \text{ yields } R_nSiOSi + HX$ (col. 3, lines 38-42). Lentz et al.'s organosilicon compounds usable for hydrophobing the hydrogel (col. 4, lines 11-27 and Examples of Lentz et al.) overlap those of WO '809, including the use of trimethylchlorosilane. Lentz et al. also teaches the use of disiloxanes of the claimed formula including hexaethyldisiloxane and hexamethyldisiloxane. It would have been obvious for one having ordinary skill in the art, seeing the references of WO '809 and Lentz et al. in combination, to have substituted any of the surface-silylating substances of Lentz et al., including hexaethyldisiloxane or hexamethyldisiloxane, as the surface-silylating substance in the invention of WO '809 with the expectation of successful results since WO '809 and Lentz et al. teach the organosilicon compounds are for the same purpose and are similarly for use in forming aerogels and the compounds react according to the same reaction.

WO '809 is silent as to a teaching that prior to step c) the lyogel is washed with a solution of an orthosilicate capable of bringing about condensation of the claimed formula. WO '942 is cited for its teaching of a process of preparing organically modified aerogels similar to WO '809. WO '942 teaches an optional step of being subjected to structure reinforcement before the silylation by reacting the gel with a solution of an orthosilicate according to the claimed formula. It would have been obvious for one having ordinary skill in the art to have performed the orthosilicate reaction step of WO '942 in the process of WO '609 in order to achieve structure

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reinforcement of WO '609's gel with the expectation of similar and successful results since WO '609 and WO '942 are similarly directed to preparing hydrophobic aerogels by similar processes.

As to claims 6-8 and 18, WO '809 additionally teaches steps of aging aerogels, adding fibers, and subcritical drying.

As to claim 9, WO '809 teaches washing until the water content is less than or equal to 5 wt% (col. 4, step d) of Frank et al.). As to claim 10, WO '809 teaches aliphatic or aromatic solvents in col. 3, lines 9-20.

As to claims 15 and 22, Lentz et al. and WO '942 teach reacting the hydrogel with the surface-modifying organosilicon compound in the presence of a strong acid catalyst. It would have been obvious to have used a catalyst in the method of WO '809 in order to increase the speed of the surface-modifying reaction with the expectation of successful results upon seeing the Lentz et al. reference since the processes of WO '809 and Lentz et al. and WO '942 are similar.

As to claims 17 and 21, WO '809 teaches that the solvent for washing is protic or aprotic, and include aliphatic alcohols (col. 3, lines 9-16).


Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C. Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Monday to Wednesday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Kirsten C Jolley
Primary Examiner
Art Unit 1762

kcj